

Remarks

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

The specification and abstract have been reviewed and revised to make a number of editorial revisions. A substitute specification and abstract have been prepared and are submitted herewith. No new matter has been added. Enclosed is a marked-up copy of the specification and abstract indicating the changes incorporated therein.

Figures 23 and 59 have been amended so as to properly label "2-32" as "2-33" and "761a" as "761b", respectively. Substitute formal drawings are submitted herewith which include these corrections. No new matter has been added.

Claims 1-4, 6-8, 27 and 35-39 have been rejected under 35 U.S.C. §102(b) as being anticipated by Kawashima (US 5,192,087). Claims 1-8, 27 and 35-39 have been rejected under 35 U.S.C. §102(b) as being anticipated by Shinbara (US 4,788,994). Claims 9-14, 16-23, 25-28 and 30-34 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Shinbara in view of Hey (US 6,551,488). Claims 15 and 24 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Shinbara in view of Hey and further in view of Koderä (US 5,695,601). Claim 29 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Shinbara in view of Hey and further in view of Tanaka (US 6,364,094).

Claims 1-39 have been canceled without prejudice or disclaimer to the subject matter contained therein. New claims 40-98 have been added.

Claims 40-98 are patentable over the above-mentioned rejections for the following reasons.

Claim 40 is patentable over the references relied upon in the rejections, since claim 40 recites a method for processing a substrate including, in part, forming a plated film on a seed layer by electroplating with applying a voltage to the seed layer, and etching the plated film by reversing the voltage. None of the references, either individually or in combination, discloses or suggests these features of claim 40.

Kawashima discloses a device 1 for supporting a wafer 2. The device 1 includes a base plate 3 with a circular opening 4 and a number of first and second supports 5 and 6 positioned on and around the base plate 3. (See column 2, lines 15-64 and Figure 1). Kawashima fails to disclose or

suggest forming a plated film on a seed layer by electroplating with applying a voltage to the seed layer, and etching the plated film by reversing the voltage. As a result, Kawashima does not disclose or suggest the present invention as recited in claim 40.

Shinbara discloses a wafer holding mechanism having a rotary plate 2 with four chuck pieces 1(1a) disposed thereon for holding an outer edge of a wafer W. The chuck pieces 1a are movable and are biased in one direction with a spring 15. The rotary plate 2 is secured to a rotary head 2A and has four radially projecting arms 2a on which are fixed two of the chuck pieces 1. Two of the chuck pieces 1a are moveable integral with sliders 3. (See column 5, lines 11-48 and Figure 1). Shinbara fails to disclose or suggest forming a plated film on a seed layer by electroplating with applying a voltage to the seed layer, and etching the plated film by reversing the voltage. As a result, Shinbara does not disclose or suggest the present invention as recited in claim 40.

Hey discloses a processing system that includes an electroplating system 200. The electroplating system 200 has a loading station 210, a rapid thermal anneal chamber 211, a spin-rinse-dry (SRD) station 212, a mainframe 214, a controller 222, an electrolyte solution replenishing system 220, and electroplating processing cells 240 (400). The electroplating processing cells 240 (400) each include a head assembly 410, a process cell 420, and an electrolytic solution collector 440. The head assembly 410 has a substrate holder assembly 450 and a substrate assembly actuator 458. (See column 4, lines 11-61 and column 9, line 33 - column 10, line 47 and Figures 1 and 6). While Hey does disclose an electroplating system 200 as discussed above, Hey fails to disclose or suggest forming a plated film on a seed layer by electroplating with applying a voltage to the seed layer, and etching the plated film by reversing the voltage. As a result, Hey does not disclose or suggest the present invention as recited in claim 40.

As for Kodera and Tanaka, these references are relied upon as disclosing a thickness measuring unit 30 including an optical sensor 31 and an optical sensor controller 32 (see column 4, lines 33-62 and Figure 2) and an aligning unit 22 (see column 10, lines 46-54 and Figure 8), respectively. However, neither Kodera or Tanaka discloses or suggests forming a plated film on a seed layer by electroplating with applying a voltage to the seed layer, and etching the plated film by reversing the voltage, as is recited in claim 40. As a result, neither Kodera or Tanaka discloses or suggests the present invention as recited in claim 40.

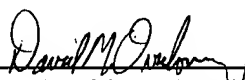
Regarding claims 61, 84, 94 and 97, these claims are patentable over the above-discussed references for similar reasons as set forth above in support of claim 40, That is, claims 61, 84, 94 and 97 each recite a method or apparatus including, in part, forming a plated film on a seed layer by electroplating with supplying a first current or a voltage and then supplying either a second current or a reverse voltage, which features are neither disclosed or suggested by the references.

Because of the above mentioned distinctions, it is believed clear that claims 40-98 are allowable over the references relied upon in the rejections. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 40-98. Therefore, it is submitted that claims 40-98 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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